

REMARKS/ARGUMENT

Claims 8-11 and 28-36 stand allowed. Claims 2, 3, 5, 22 and 39 stand objected to as being dependent upon a base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Claims 1, 4, 6, 7, 12-21, 23-27, 38 and 40-47 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Winters (IEEE document) in view of Tangemann (US 6,636,495). Applicants respectfully traverse this rejection as follows:

The Examiner states that "Tangemann teaches a diversity transmission where phase information related to signals transmitted by transmitter diversity antennas are fed back to the transmitter diversity antennas so that the phases of signals provided to the antennas are changed in a way to achieve a diversity gain at the receiver. See col.4, lines 59-65. Thus, it would have been obvious to one skilled in the art at the time the invention was made to selectively phase shift the communication signal $S(t)$ of Winters prior to respective delays (D , $2D$, ...) to respective antennas for the purpose of having the delayed signals received at the receiver without phase differences as taught by Tangemann." (Office Action dated , page 3, line17 – page 4, line 3).

The Examiner's argument above is flawed because signals need to arrive at the receiver at the same time in order to be constructively combined. If the signals arrive without phase differences but at different times, then the signals are not constructively combined.

Tangemann teaches that phase compensation can be used with transmit antenna diversity, and he specifically teaches that **SPACE or POLARIZATION diversity** can be used at the transmitter (column 2, lines 66-67 and column 3, lines 1-2). With space diversity, the antennas are spaced apart, but transmit at the same time. With polarization

diversity, the antennas transmit on orthogonal polarizations, but again transmit at the same time. This allows the signals to be co-phased at the receiver since they arrive at the same time at the receiver. As a result, there is no evidence in the prior art that supports the motivation set forth by the Examiner for a combination of Winters and Tangemann. The motivation set forth by the Examiner is nothing more than hindsight reconstruction.

In proceedings before the Patent and Trademark Office, “the Examiner bears the burden of establishing a prima facie case of obviousness based upon the prior art”. In re Fritch, 23 USPQ2d 1780, 1783 (Fed. Cir. 1992) (citing In re Piasecki, 745 F.2d 1468, 1471-72, 223 USPQ 785, 787-88 (Fed. Cir. 1984). “The Examiner can satisfy this burden **only by showing some objective teaching in the prior art or that knowledge generally available to one of ordinary skill in the art would lead that individual to combine the relevant teachings of the references**”, In re Fritch, 23 USPQ2d 1780, 1783 (Fed. Cir. 1992)(citing In re Fine, 837 F.2d 1071, 1074, 5 USPQ2d 1596, 1598 (Fed. Cir. 1988)(citing In re Lalu, 747 F.2d 703, 705, 223 USPQ 1257, 1258 (Fed. Cir. 1988)). Since the Examiner has failed to provide any OBJECTIVE teaching in the prior art or evidence that such knowledge was available to one of ordinary skill in the art and would lead that individual to combine the relevant teachings of the references, the Examiner has failed to present a prima facie case of obviousness for the rejection of Claims 1, 4, 6, 7, 12-22, 24-27, 37, 38, 40-47. As a result, the 35 U.S.C. 103(a) rejection is overcome.

Moreover, it is not obvious to use co-phasing with delay diversity. If the phases of the signals are simply compensated so that they arrive at the receiver with no phase difference, the signals do not constructively combine since they arrive at different times. Applicant's invention solves this problem by estimating the delay path profile for each antenna and then adjusting the delay between the antennas to provide extra path diversity and adjusting the transmit phases so that paths that arrive at the same time can be co-phased.

In addition to the above, Applicants reassert the arguments they made in their previous response, as set forth below:

The motivation provided by the Examiner for combining Winters and Tangemann is as follows: It would have been obvious to one skilled in the art at the time invention was made to selectively phase shift the communication signal $S(t)$ of Winters prior to respective delays (D , $2D$, ...) to respective antennas for the purpose of having the delay signals received at the receiver without phase differences as taught by Tangemann. Applicants challenge this motivation as nothing more than hindsight reconstruction. The Examiner states "what is accomplished by combining Winters and Tangemann" but not "why one would have been motivated to make the combination at the time of the invention". Moreover, the Examiner fails to provide any evidence in the prior art that suggests, supports or recommends any such combination of technologies. Accordingly, the Examiner has failed to show **some objective teaching in the prior art or that knowledge generally available to one of ordinary skill in the art would lead that individual to combine the relevant teachings of the references**, as is required by case law. Accordingly, the 35 U.S.C. 103(a) rejection is erroneous.

Even if, *arguendo*, there were to be support in the prior art for the Examiner's combination of Winters and Tangemann, the combination of references fails to teach or suggest all of the elements of the claims.

Independent Claim 1 requires and positively recites a method of communicating data between **a transmitter having a plurality of antennas** and at least one remote receiver, the method comprising the steps of: "selectively phase shifting data communication signals produced at the transmitter to generate derived versions of channel communication signals, each derived version of the channel communication signals having its desired data communication signal phase shift", "**transmitting from the transmitter, derived versions of the channel communication signal to each**

antenna within the plurality of antennas” and “providing a distinct delay associated with EACH derived version of the channel communication signal and its respective antenna”.

Independent Claim 12 requires and positively recites, a communication system comprising: **“a transmitter having a plurality of spaced apart antennas”**, **“signal distributing means for coupling communication signals between the transmitter and the plurality of spaced apart antennas”**, **“delaying means operatively coupled to the antennas and the signal distributing means for providing a distinct delay in EACH of the communication signals coupled between the transmitter and the plurality of spaced apart antennas”** and **“channel measuring means operatively coupled to the signal distributing means for providing a derived version of each communication signal transmitted from a transmitter channel to the plurality of spaced apart antennas”**.

Independent Claim 18 requires and positively recites, a data communication system comprising: **“a transmitter having a plurality of spaced apart antennas”**, **“at least one remote receiver in communication with the transmitter”**, **“means for providing a derived version of each communication signal transmitted from a transmitter channel to the plurality of spaced apart antennas”** and **“means for providing a distinct delay associated with each antenna such that a derived version of a communication signal coupled between the transmitter and the plurality of spaced apart antennas can be demodulated within the at least one remote receiver”**.

Independent Claim 24 requires and positively recites, a data communication system comprising: **“a transmitter having a plurality of spaced apart antennas”**, **“means for transmitting from the transmitter, derived versions of a communication signal to each antenna within the plurality of spaced apart antennas”** and **“means for providing a**

distinct delay associated with each derived version of the communication signal and its respective antenna within the plurality of spaced apart antennas”.

Independent Claim 37 requires and positively recites, a method of communicating data between a transmitter having a plurality of antennas and at least one remote receiver, the method comprising the steps of: “selectively amplitude scaling data communication signals produced at the transmitter to generate derived versions of channel communication signals, each derived version of the channel communication signals having its desired data communication signal amplitude”, “transmitting from the transmitter, derived versions of the channel communication signal to each antenna within the plurality of antennas” and “**providing a distinct delay associated with EACH derived version of the channel communication signal and its respective antenna**”.

Independent Claim 42 requires and positively recites, a data communication system comprising: “a transmitter having a plurality of spaced apart antennas”, “at least one remote receiver in communication with the transmitter”, “means for providing a derived version of each communication signal transmitted from a transmitter channel to the plurality of spaced apart antennas, wherein the means for providing a derived version of each communication signal is configured to phase shift a communication signal transmitted from the transmitter to the plurality of spaced apart antennas” and “**means for providing a distinct delay associated with EACH antenna** such that a derived version of a communication signal coupled between the transmitter and the plurality of spaced apart antennas can be demodulated within the at least one remote receiver”.

Independent Claim 45 requires and positively recites, a data communication system comprising: “a transmitter having a plurality of spaced apart antennas”, “at least one remote receiver in communication with the transmitter”, “means for providing a derived version of each communication signal transmitted from a transmitter channel to

the plurality of spaced apart antennas, wherein the means for providing a derived version of each communication signal is configured to amplitude scale a communication signal transmitted from the transmitter to the plurality of spaced apart antennas” and **“means for providing a distinct delay associated with each antenna** such that a derived version of a communication signal coupled between the transmitter and the plurality of spaced apart antennas can be demodulated within the at least one remote receiver”.

The Examiner contends that Winters discloses all of the limitations of Claim 1 except, “selectively phase shifting data communication signals produced at the transmitter to generate derived version of” the data communication signals (Office Communication, page 2, lines 10-17). The Examiner proposes to add Tangemann to Winters to supply the teaching missing in Winters. Applicants challenge the Examiner’s interpretation of Winters, as follows:

In actuality, the Winters reference discloses a transmit diversity system in which NO DELAY is associated with a first antenna while distinct delays are associated with the second, third and fourth antennas (See Fig. 1). Contrariwise, the present invention discloses a delay for EACH antenna. As a result, fails to teach or suggest, **“providing a distinct delay associated with EACH derived version of the channel communication signal and its respective antenna”**, as required by Claim 1, or **“delaying means operatively coupled to the antennas and the signal distributing means for providing a distinct delay in EACH of the communication signals coupled between the transmitter and the plurality of spaced apart antennas”**, as required by Claim 12, or **“means for providing a distinct delay associated with each antenna** such that a derived version of a communication signal coupled between the transmitter and the plurality of spaced apart antennas can be demodulated within the at least one remote receiver”, as required by Claim 18, or **“means for providing a distinct delay associated with EACH derived version of the communication signal and its respective antenna within the plurality of spaced apart antennas”**, as required by Claim 24, or **“providing a distinct delay**

associated with EACH derived version of the channel communication signal and its respective antenna", as required by Claim 37, or **"means for providing a distinct delay associated with EACH antenna** such that a derived version of a communication signal coupled between the transmitter and the plurality of spaced apart antennas can be demodulated within the at least one remote receiver", as required by Claim 42, or **"means for providing a distinct delay associated with each antenna** such that a derived version of a communication signal coupled between the transmitter and the plurality of spaced apart antennas can be demodulated within the at least one remote receiver", as required by Claim 45.

Even if, arguendo, Tangemann were to teach "a diversity transmission where phase information related to signals transmitted by transmitter diversity antennas are fed back to the transmitter diversity antennas so that the phases of signal provided to the antennas are changed in a way to achieve a diversity gain at the receiver", as suggested by the Examiner (Office Action, page 2, lines 17-20), Tangemann fails to teach or suggest a distinct delay associated with EACH antenna, as required by the claims.

Moreover, since Tangemann discloses two transmitting means "MXA" coupled to antennas 1 and 3 while transmitting means "MXB" is coupled to antennas 2 and 4, Tangemann does not disclose coupling its transmitter to "a plurality of spaced apart antennas", as is required by the pending claims. Two is not "a plurality" and there is no teaching in Tangemann to expand two to a plurality.

To establish a prima facie case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest ALL the claim limitations. The teaching or suggestion to make the claimed

combination and the reasonable expectation of success must both be found in the prior art, and not based on applicant's disclosure. In re Vaeck, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991). The Examiner has not satisfied the above requirements in rejecting Claims 1, 12, 18, 24, 37, 42 and 45. Accordingly, the 35 U.S.C. 103(a) rejection is overcome.

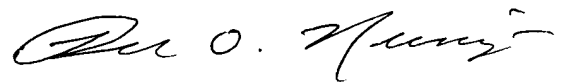
Even if, *arguendo*, all of the claim limitations of Claims 1, 12, 18, 24, 37, 42 and 45 are present when Winters and Tangemann are combined, "obviousness cannot be established by combining the teachings of the prior art to produce the claimed invention, **absent some teaching or suggestion supporting the combination. Under section 103, teachings of references can be combined ONLY if there is some suggestion or incentive to do so.**" ACS Hosp. Systems, Inc. v. Montefiore Hosp., 732 F.2d 1572, 1577, 221 USPQ 929, 933 (Fed. Cir. 1984). Although couched in terms of combining teachings found in the prior art, the same inquiry must be carried out in the context of a purported obvious "modification" of the prior art. **The mere fact that the prior art may be modified in the manner suggested by the Examiner and the Board does not make the modification obvious unless the prior art suggested the desirability of the modification.** In re Gordon, 733 F.2d at 902, 221 USPQ at 1127. Moreover, it is impermissible to use the claimed invention as an instruction manual or "template" to piece together the teachings of the prior art so that the claimed invention is rendered obvious. In re Gorman, 933 F.2d 982, 987, 18 USPQ2d 1885, 1888 (Fed.Cir.1991). See also Interconnect Planning Corp. v. Feil, 774 F.2d 1132, 1138, 227 USPQ 543, 547 (Fed.Cir.1985).

Claims 4, 6, 7, 13-21, 23, 25-27, 38, 40, 41, 43, 44, 46 and 46 stand allowable as depending from allowable claims and including further limitations not taught or suggested by the references of record.

Claims 8-11 and 28-36 stand allowed. While Applicants appreciate the Examiner's determination that objected to Claims 2, 3, 5, 22 and 39 would be allowable if rewritten in independent form including all of the limitations of the base claim and any

intervening claims, Applicants respectfully submit that they are allowable in their present form. The rejection of Claims 1, 4, 6, 7, 12-21, 23-27, 38 and 40-47 under 35 U.S.C. 103(a) as being unpatentable over Winters (IEEE document) in view of Tangemann (US 6,636,495) has been overcome. Applicants respectfully request allowance of the application as the earliest possible date.

Respectfully submitted,



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